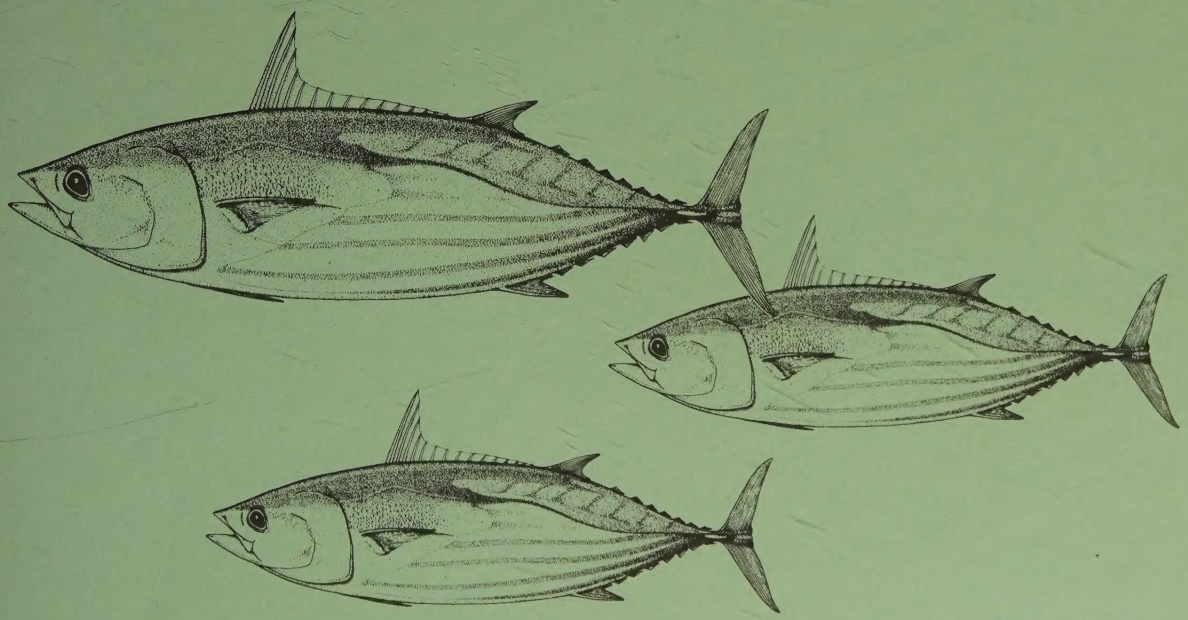
DECEMBER 1974
No. 12

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California



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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
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FISHING INFORMATION

DECEMBER 1974 , No. 12

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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) a narrative description of subsurface temperature structure for parts of the North Pacific, 4) charts of winds and pressures for the eastern North Pacific, 5) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 6) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

L.E. Eber, Leader
Fishery Information Systems
Southwest Fisheries Center
La Jolla, California

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by the Office of Management and Budget, August 20, 1973; this approval expires June 1976.

Submitted for publication - January 22, 1975

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L.Eber (Figures 4 and 6)
F.Miller (Figures 8 and 9)
J.Renner (Figures 1,2,3,5,7,10,11 and 15-day Supplement)

TECHNICAL EDITOR:
K.Raymond

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R.Allen

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Scripps Institution of Oceanography, La Jolla, California
Fishing Vessels, Larry Roe, Lois Seaver, Sea Treasure.

Expendable bathythermcgraph and salinity observations are made by the mates and engineers of the Monterey of Pacific Far East Line. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

L. EBER AND F. MILLER

Eastern North Pacific

The surface layer of the eastern north Pacific continued to cool in December 1974, as temperatures dropped as much as 4°F (2.2°C) from November values. The rate of cooling was a little above normal in the latitude zone 40° to 55°N. South of 40°N the rate of cooling was a little less than normal, except in the region between 140° and 150°W. These deviations from the normal cycle had little effect on the anomalous temperature pattern (Figure 5) which, consequently, looks about the same as it did in November.

The main features of this pattern are an area of relatively cold water between 30° and 45°N, west of 145°W, partially encircled on the north, east and south by waters which are warmer than normal. Temperatures off California, to about 130°W and off Baja California, extending southwestward toward Hawaii, remained below normal. The magnitudes of the deviations, both positive and negative, exceeded 2°F (1.1°C) in only a few areas.

A strong high pressure cell dominated the region south of 40°N and east of 160°W where positive departures from normal were as high as 6 millibars (Figures 1 and 2). Along the Aleutian Islands and in the Gulf of Alaska, north of 55°N, a strong low pressure trough prevailed with negative deviations reaching 8 millibars. A strong gradient between these areas of high and low pressure caused anomalous southerly and southwesterly wind components over most of the region west of 135°W. Such a pronounced pattern of resultant winds should induce a detectable response in the anomalous sea surface temperature field. In this case, however, a simple cause and effect relationship is not evident, possibly owing to compensating effects of other factors.

Western North Pacific

Sea surface temperature conditions in the western north Pacific in December 1974 tended to remain about the same as in November except for normal seasonal cooling. The region from 35° to 50°N was cooler than normal for the most part with negative deviations reaching 4°F (2.2°C) west of Hokkaido and 2°F (1.1°C) in a few other areas (Figure 6). Temperatures were mostly warmer than normal in the region 20° to 30°N and north of 50°N off Kamchatka.

Surface winds over most of the region north of 30°N ranged from westerly to northwesterly and were fairly persistant throughout the month.

Eastern Tropical Pacific

From November to December the sea surface temperature normally increases 2° to 4°F (1.1° to 2.2°C) in the Peru Current of the southern hemisphere, from 30°S to the Galapagos Islands. In the northern hemisphere, the largest seasonal temperature change in tropical latitudes is a decrease of 2° to 3°F (1.1° to 1.7°C) in the California Current and its southern extension to the west and south of Baja California.

The equatorial ocean front near the equator between Ecuador and the Galapagos Islands usually has a significantly weaker north-south surface temperature gradient than in November due to seasonal warming in the northern part of the Peru current.

In December 1974 the warming of the Peru Current was progressing at the normal rate (Figure 8). Along the coast of South America temperatures were only slightly below normal (Figure 9). Although ship observations were sparse off South America, the few reports of sea level barometric pressures and sea surface temperatures indicated that environmental conditions were near normal. There were no significant positive temperature anomalies in the southern hemisphere (Figure 9).

Along the equator, anomalies were not significantly different from those in November, except to the west of 150°W, where the surface temperatures warmed up faster than normal. The equatorial areas (5°N to 5°S) with negative anomalies greater than 2°F (1.1°C) have been gradually shrinking in latitude and shifting eastward during the past 2 months to the region between 100° and 120°W.

In the northern hemisphere from 20°N to the equator, temperatures cooled slightly less than normal. This suggests a slight warming trend in the eastern tropical Pacific which has been spreading slowly to areas west of 130°W. Southwest of Baja California the 2° to 4°F (1.1° to 2.2°C) negative temperature anomaly has been a persistent feature for the past 3 months.

Subsurface Temperature Structure in the Northeast Pacific Ocean

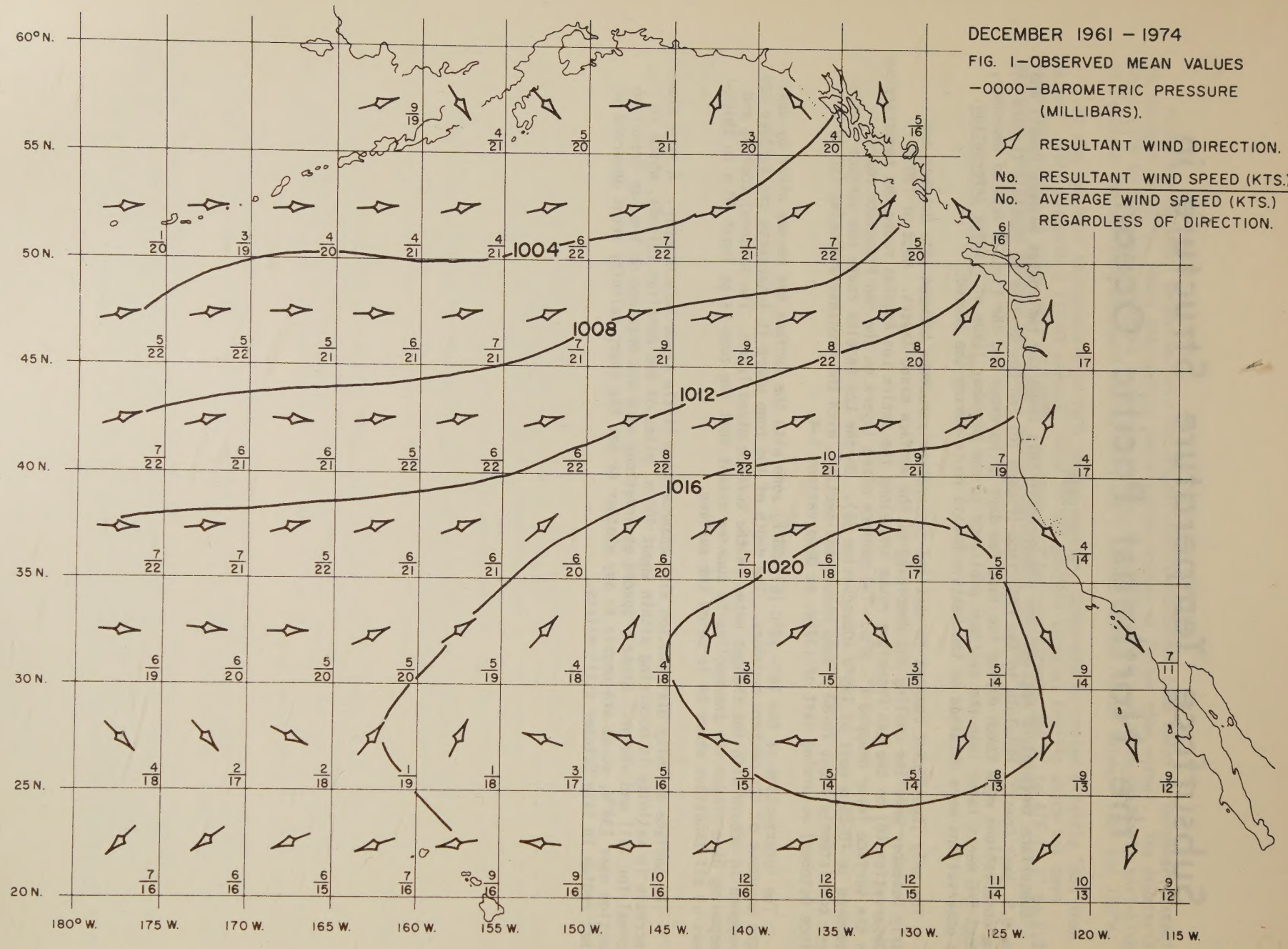
J. F. T. SAUR

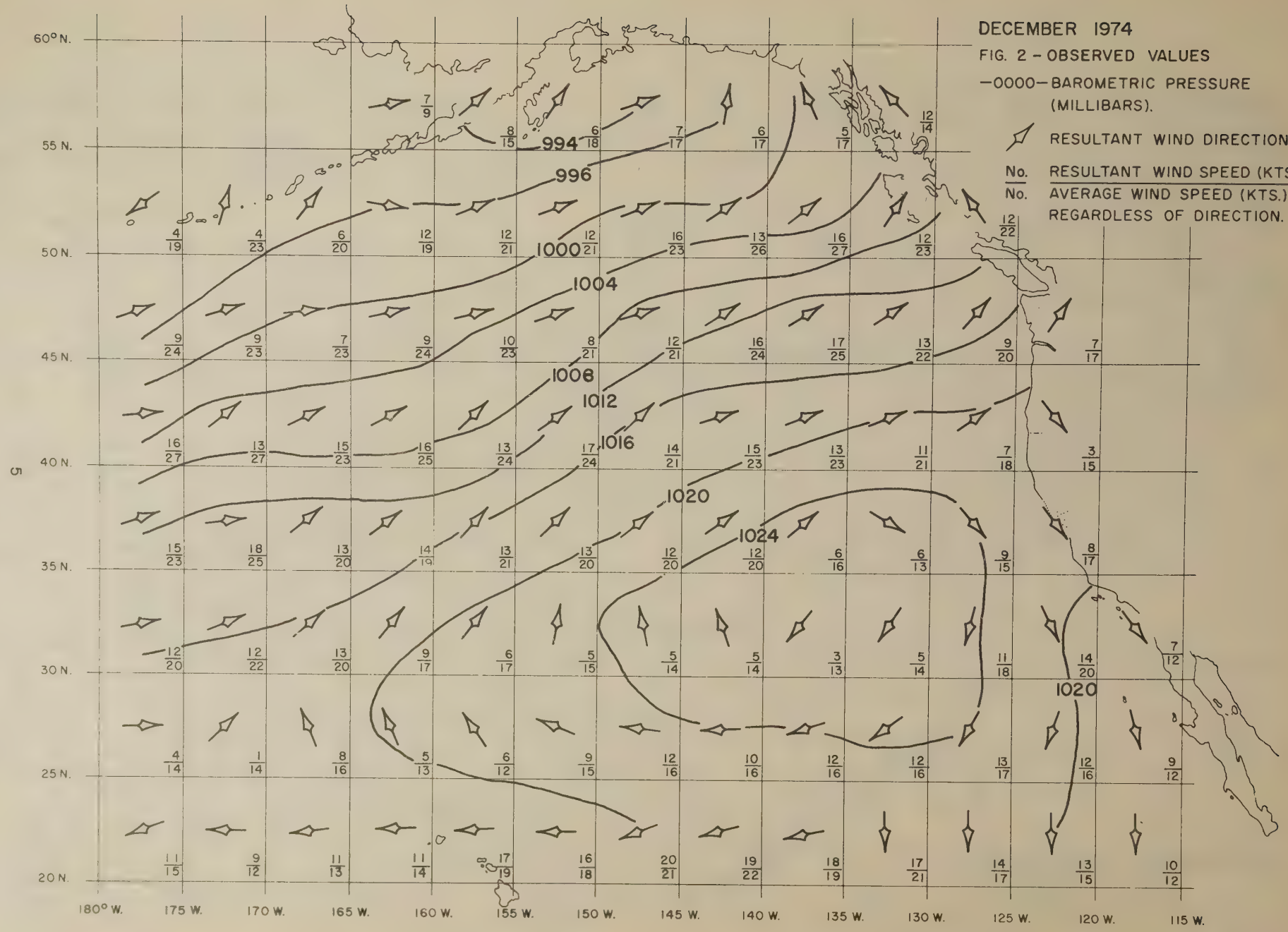
Subsurface temperature sections are presented in this issue for two routes between Hawaii and the U.S. West Coast: Honolulu to San Francisco (Figure 10) and Los Angeles to Honolulu (Figure 11). The observations were taken during the last few days of November and the first 9 days of December, about 5-6 weeks later than the sections published in the November issue of Fishing Information. No observations were obtained on the Seattle-Hawaii route during the period.

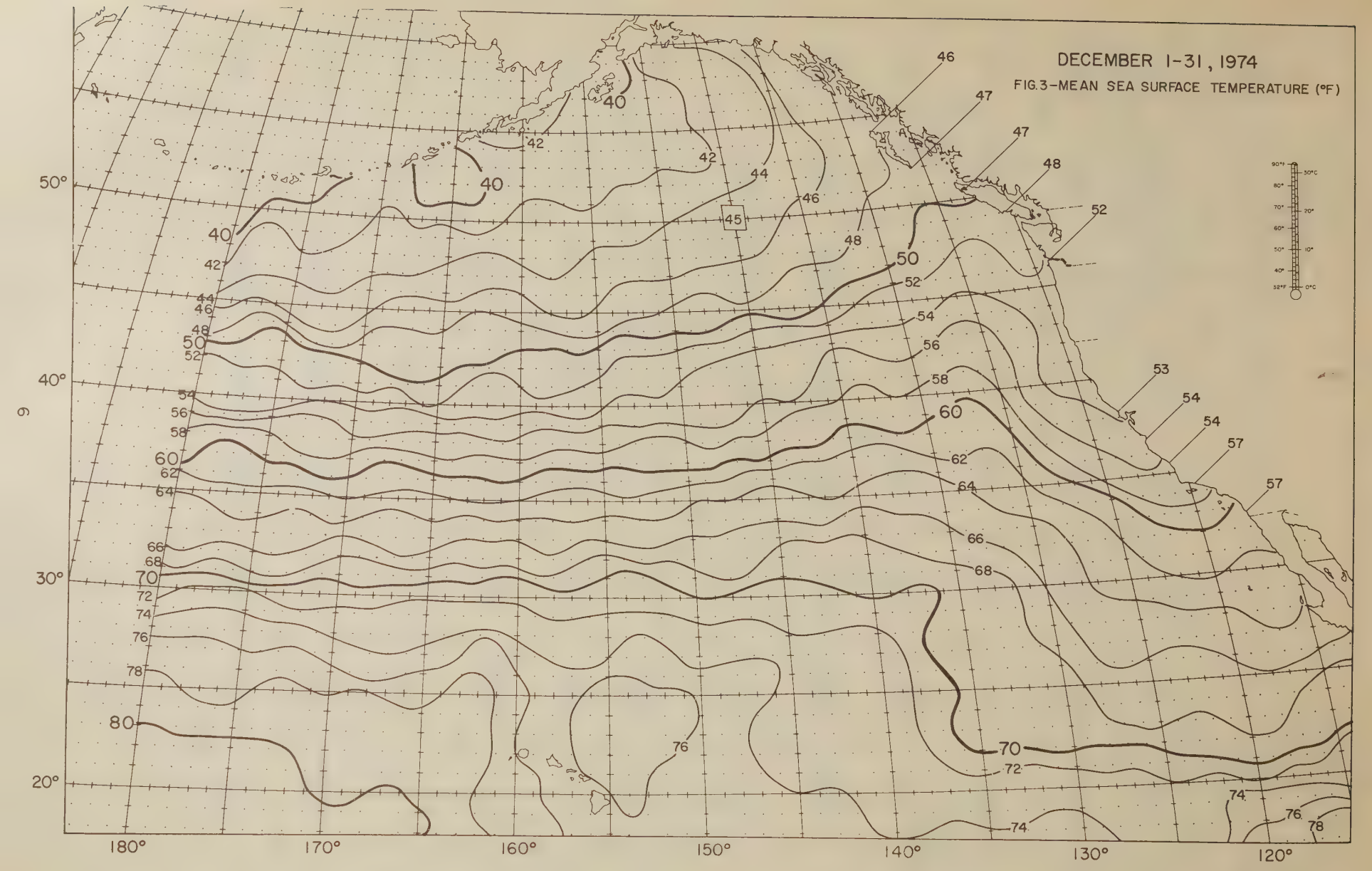
The only significant changes in vertical temperature structure between late October and early December were the cooling and deepening of the surface mixed layers. West of 130°W (Observation 40) on the San Francisco route and along the entire Los Angeles route the temperatures in the surface layer dropped 1°- 2°C. The surface mixed layers on the San Francisco route deepened to 70-85 m east of 135°W (Observation 36). On the Los Angeles route the surface layers were consistently about 70-80 m deep across the section, with the greatest deepening (20-40 m since October) occurring east of 133°W, at Observations 1-4.

The intersection of the 16°- 19°C (61°-66°F) zone with the surface has become wider by westward movement of its western boundary. The depth of the zone where it intersects the surface has deepened in accord with the changes noted in the surface mixed layer. The seasonal cooling and deepening have eroded the thermocline to such an extent that the zone is at least 40 m in thickness at all locations where it is below the surface.

The surface salinity distribution also changed very little since late October. A very slow increase in salinity is occurring within about 400 n. miles of the Hawaiian Islands, which is normal for fall and winter. Closely spaced observations were not obtained on the San Francisco section near 134°W, so we are unable to say whether or not the sharp salinity front observed in that region in late October still exists.

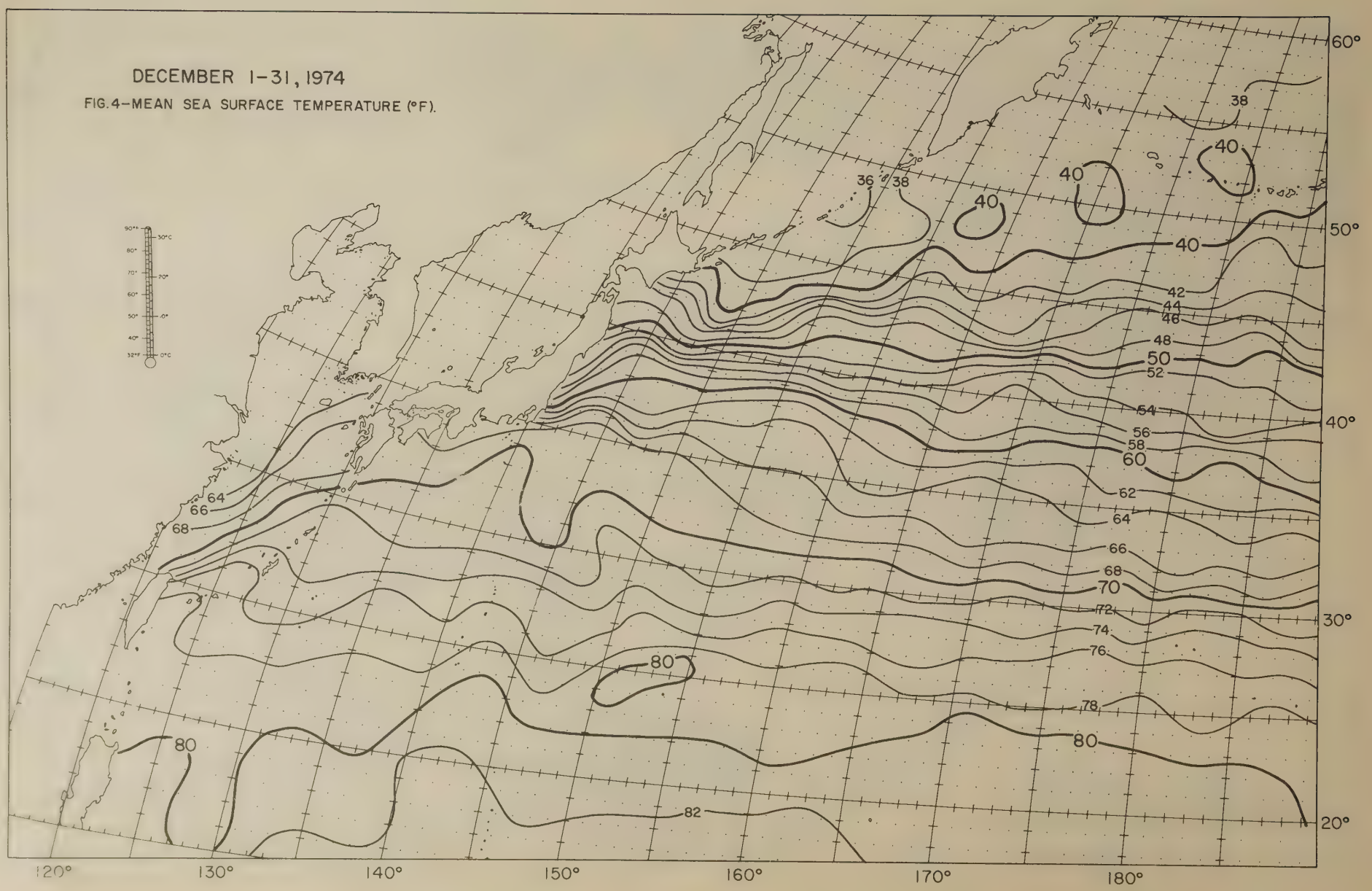

DECEMBER 1961 – 1974
FIG. 1—OBSERVED MEAN VALUES
—0000—BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.).
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1004
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

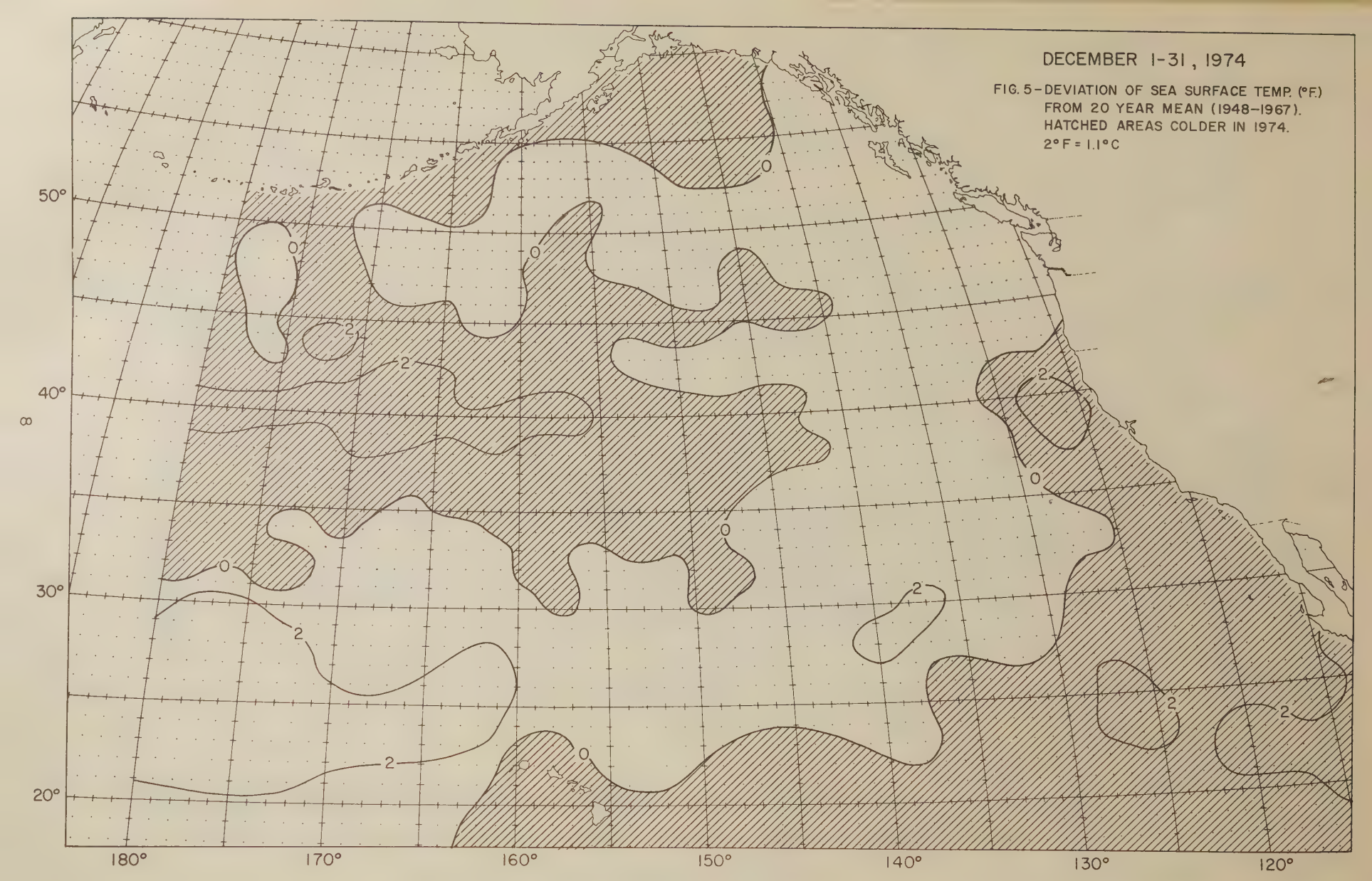

DECEMBER 1974
FIG. 2 - OBSERVED VALUES
—0000— BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
994
996
1000
1004
1008
1012
1016
1020
1024
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.

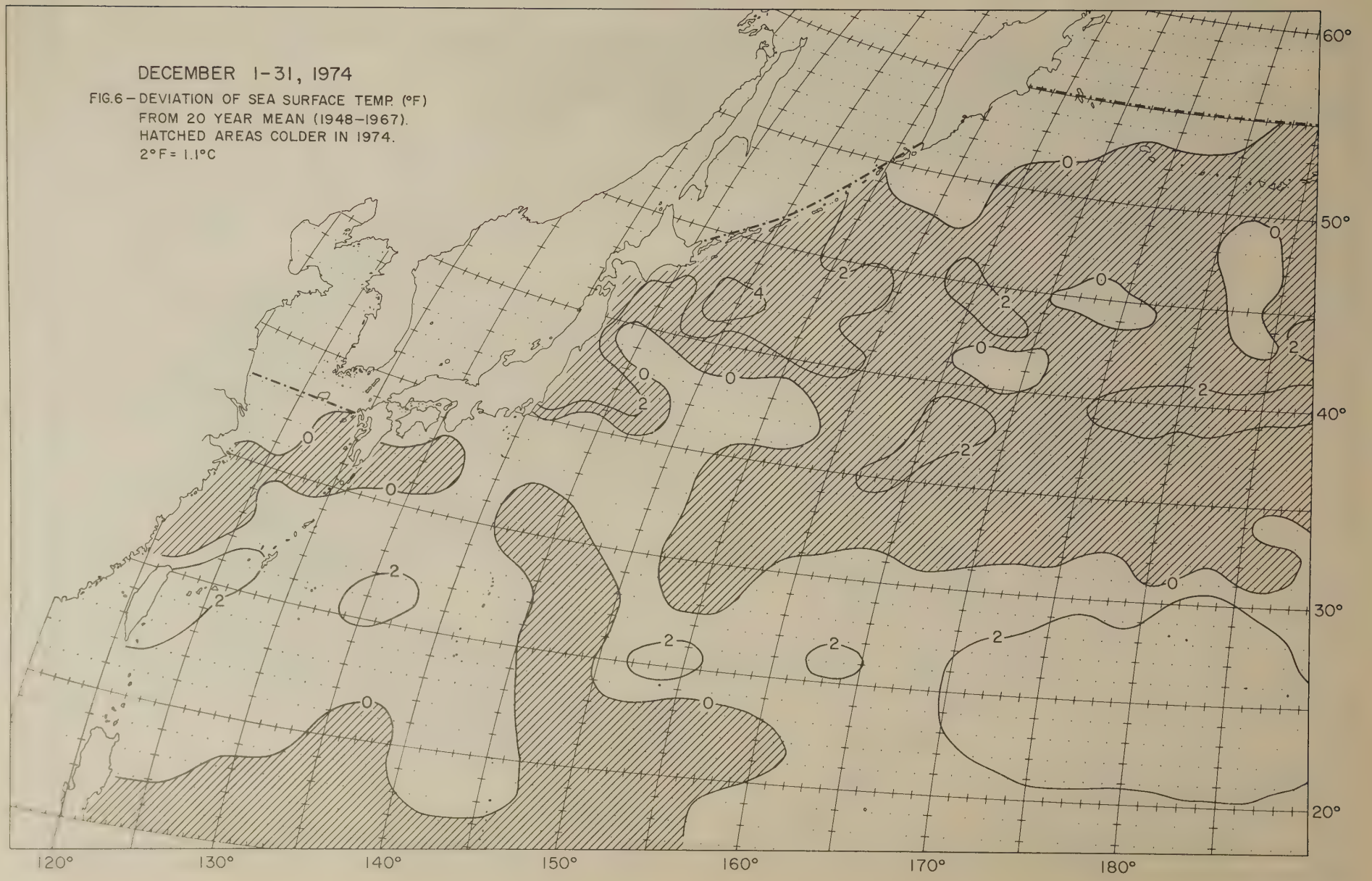

DECEMBER 1-31, 1974
FIG.3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
90°F
80°
70°
60°
50°
40°
32°F
50°C
30°
10°
0°C

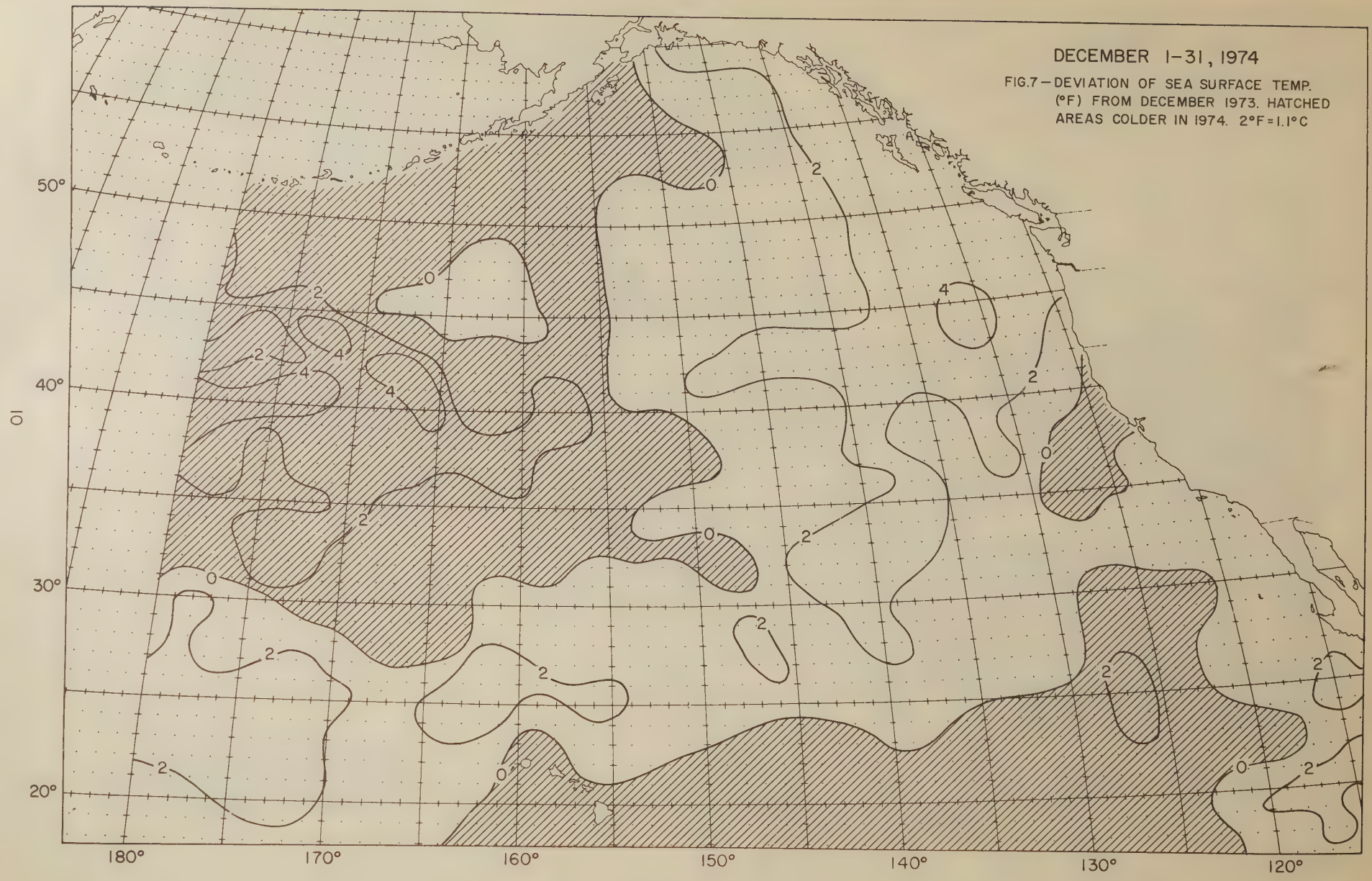
DECEMBER 1-31, 1974

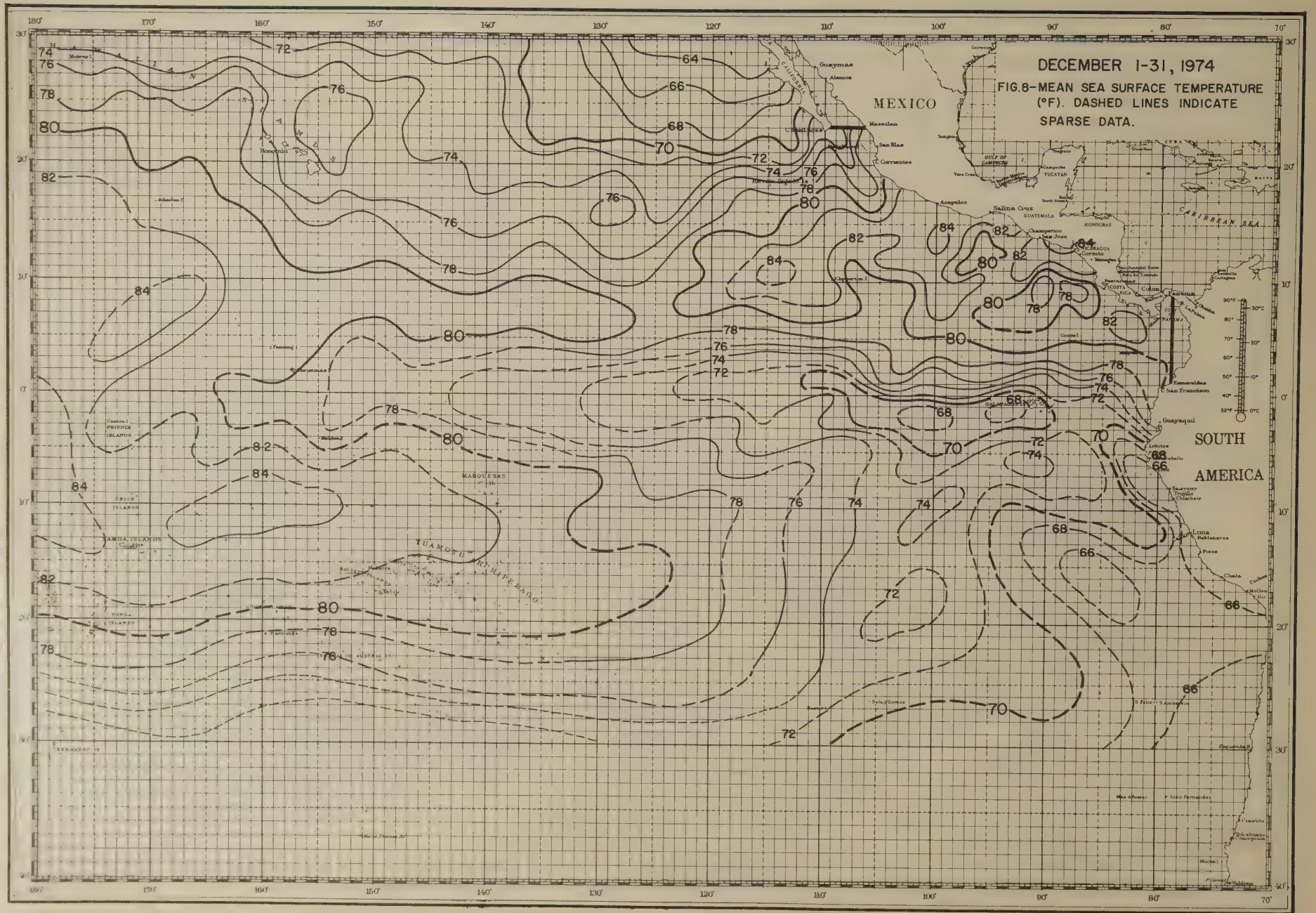
FIG. 4—MEAN SEA SURFACE TEMPERATURE (°F).




DECEMBER 1-31, 1974
FIG. 5 - DEVIATION OF SEA SURFACE TEMP. (°F.) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS COLDER IN 1974.
2° F = 1.1° C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


DECEMBER 1-31, 1974
FIG.6 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948–1967). HATCHED AREAS COLDER IN 1974. 2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°
0
2
4


DECEMBER 1-31, 1974
FIG.7 – DEVIATION OF SEA SURFACE TEMP. (°F) FROM DECEMBER 1973. HATCHED AREAS COLDER IN 1974. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2
4


DECEMBER 1-31, 1974
FIG.8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GULF OF CALIFORNIA
GULF OF CAMPECHE
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
PANAMA
GALAPAGOS IS.
MARQUESAS IS.
TUAMOTU ARCHIPELAGO
SOCIETY ISLANDS
TONGA ISLANDS
SAMOA ISLANDS
PHOENIX ISLANDS
Guaymas
Mazatlan
San Blas
Corrientes
Acapulco
Salina Cruz
Champerico
Corinto
Managua
Colon
Panama
Guayaquil
San Francisco
Lobitos
Talara
Salaverry
Trujillo
Chimbote
Lima
Callao
Pisco
Chala
Honolulu
Hilo
Fanning I.
Christmas I.
Canton I.
Enderbury I.
Howland I.
Baker I.
Jarvis I.
Palmyra I.
Johnston I.
Kingman Reef
Malden I.
Penrhyn I.
Nassau I.
Suwarrow I.
Rarotonga
Manuae
Aitutaki
Papeete
Tahiti
Moorea
Raiatea
Tahaa
Bora Bora
Huahine
Maupiti
Tubuai
Rapa
Raivavae
Rurutu
Mangareva
Pitcairn I.
Henderson I.
Ducie I.
Oeno I.
Easter I.
Juan Fernandez
Mas Afuera
Mas a Tierra
Sala y Gomez
San Felix
San Ambrosio
Coquimbo
Valparaiso
Mocha I.
Tubuai Manu Is.
Bermuda
90°F 30°C
80° 20°
70° 10°
60° 0°
50° 10°
40° 20°
32°F 0°C

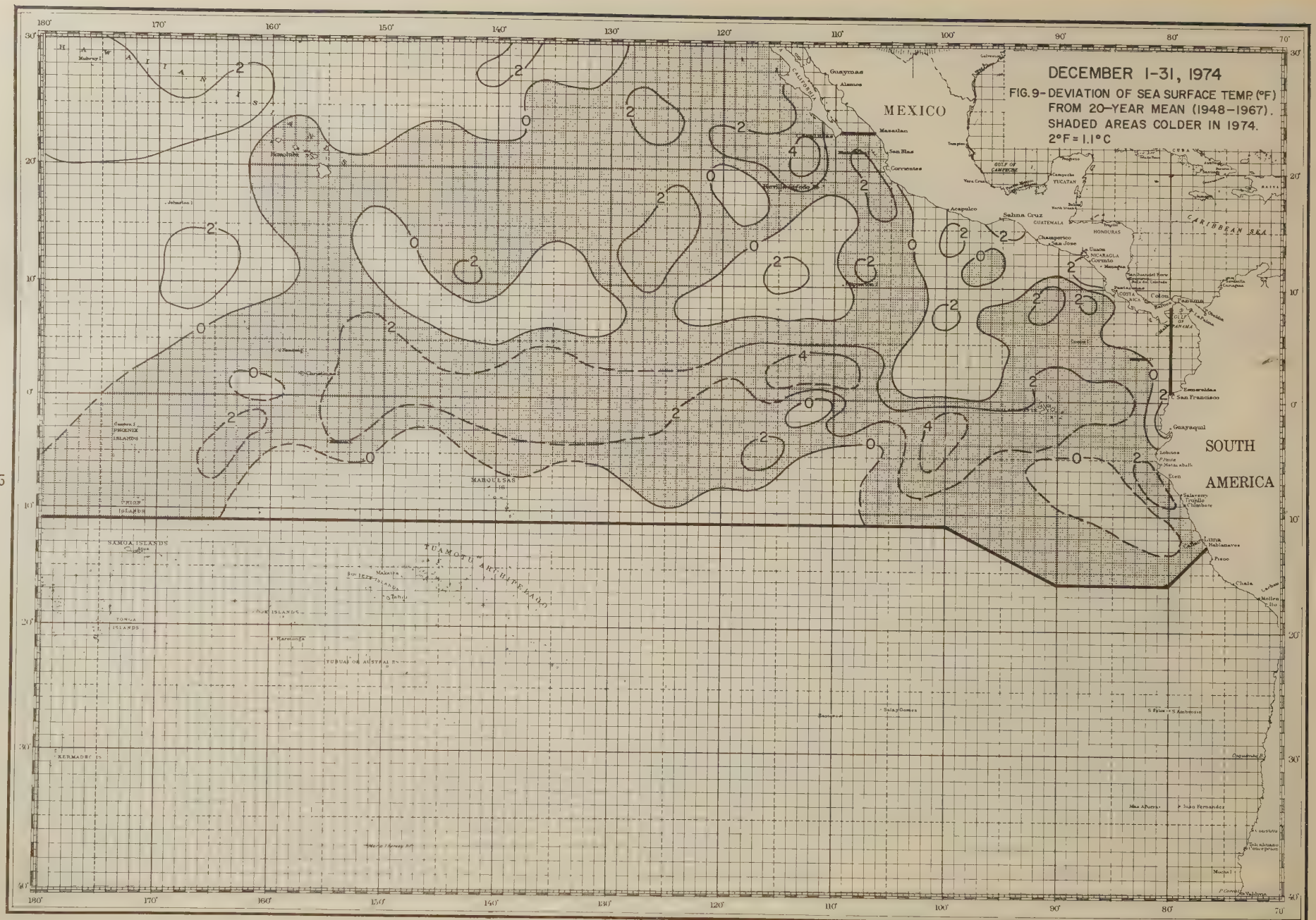

DECEMBER 1-31, 1974
FIG. 9- DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20-YEAR MEAN (1948-1967). SHADED AREAS COLDER IN 1974.
2°F = 1.1°C
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
HONDURAS
GUATEMALA
COSTA RICA
PANAMA
CUBA
HAWAIIAN IS.
PHOENIX ISLANDS
LINE ISLANDS
SAMOA ISLANDS
TONGA ISLANDS
TUAMOTU ARCHIPELAGO
MARQUESAS
KERMADEC IS.
Guaymas
Mazatlan
San Blas
Acapulco
Salina Cruz
Champerico
San Jose
Corinto
Panama
Esmeraldas
Guayaquil
Salaverry
Lima
Callao
Pisco
Chala
Mollendo
Arica
Iquique
Juan Fernandez
Easter I.
Honolulu
Tahiti
Nukuhiva
Hanaiapa
Tubuai or Austral Is.
Raroia
Malden I.
Jarvis I.
Howland I.
Baker I.
Canton I.
Enderbury I.
Christmas I.
Johnston I.
Palmyra I.
Fanning I.
Washington I.
Nassau I.
Suwarrow
Manihiki
Rakahanga
Penrhyn
Pukapuka
Nassau
Samoa
Tutuila
Manua
Rose I.
Swains I.
Funafuti
Nanumea
Nanumanga
Niutao
Nui
Nukufetau
Nukulaelae
Vaitupu
Nanumaga
Niulakita
Rotuma
Fiji
Suva
Viti Levu
Vanua Levu
Taveuni
Kandavu
Lau Group
Lakeba
Moala
Matuku
Totoya
Fulaga
Ongea
Vatoa
Ono
Kadavu
Rotuma
Futuna
Alofi
Wallis I.
Uvea
Niue I.
Aitutaki
Rarotonga
Mangaia
Atiu
Mauke
Mitiaro
Manuae
Takutea
Palmerston I.
Penrhyn
Nassau
Suwarrow
Rakahanga
Manihiki
Pukapuka
Nassau
Samoa
Tutuila
Manua
Rose I.
Swains I.
Funafuti
Nanumea
Nanumanga
Niutao
Nui
Nukufetau
Nukulaelae
Vaitupu
Nanumaga
Niulakita
Rotuma
Fiji
Suva
Viti Levu
Vanua Levu
Taveuni
Kandavu
Lau Group
Lakeba
Moala
Matuku
Totoya
Fulaga
Ongea
Vatoa
Ono
Kadavu
Rotuma
Futuna
Alofi
Wallis I.
Uvea
Niue I.
Aitutaki
Rarotonga
Mangaia
Atiu
Mauke
Mitiaro
Manuae
Takutea
Palmerston I.
180°
170°
160°
150°
140°
130°
120°
110°
100°
90°
80°
70°
30°
20°
10°
0°
10°
20°
30°
40°
50°

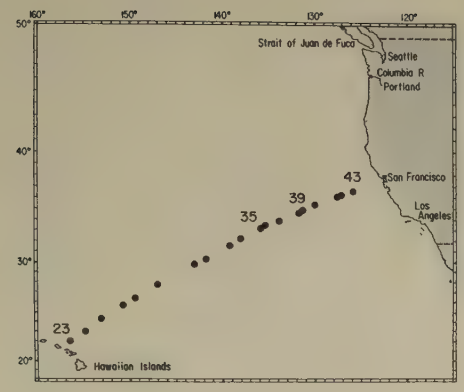
FIGURE 10

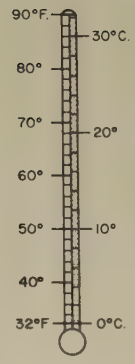
HONOLULU – SAN FRANCISCO

NOVEMBER 28–DECEMBER 2, 1974

MONTEREY

VOYAGE 61





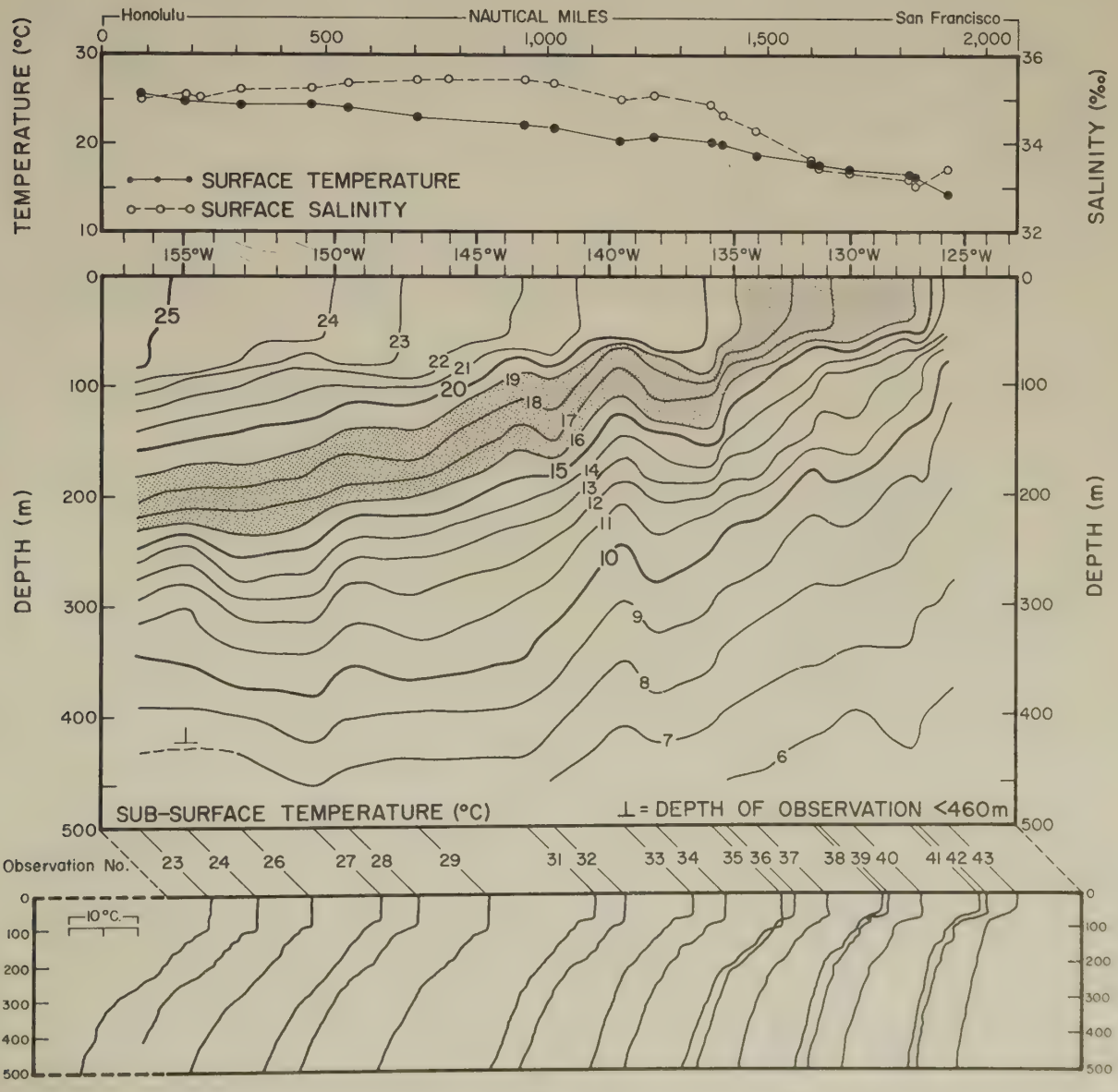
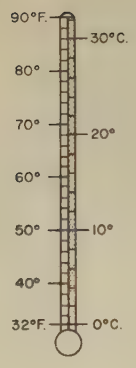


FIGURE 11

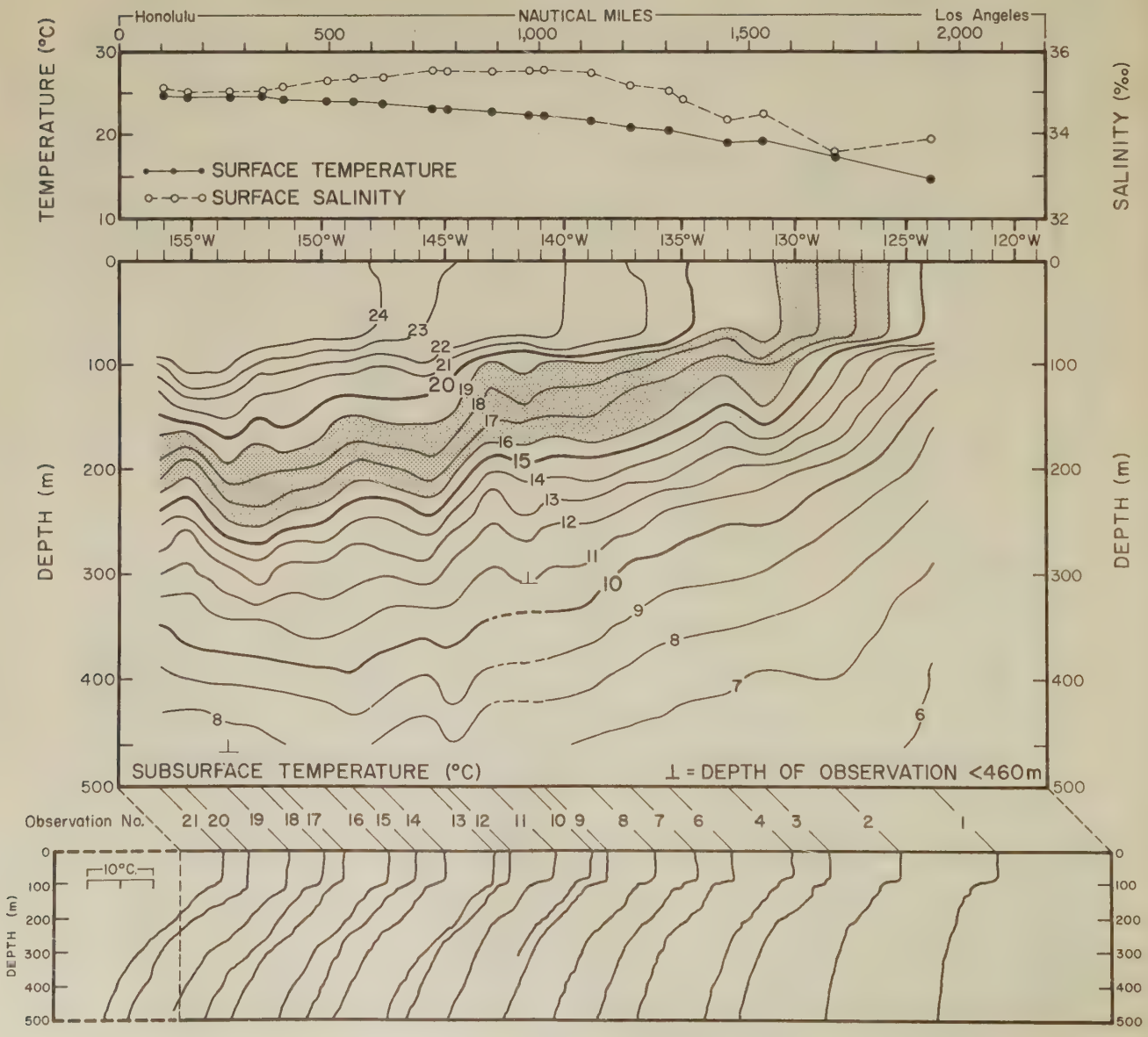


HONOLULU — LOS ANGELES

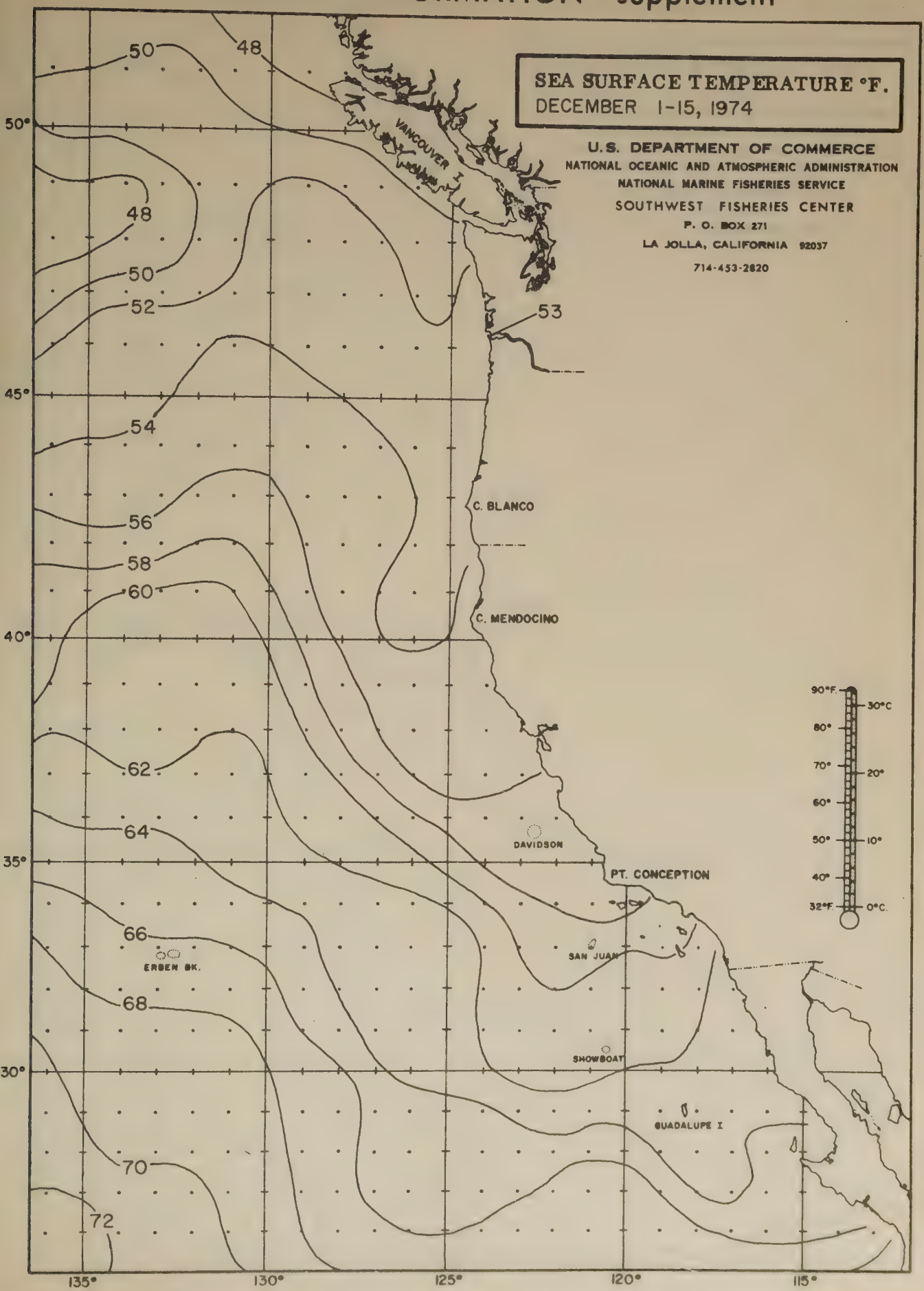
DECEMBER 5-9, 1974

MONTEREY

VOYAGE 62



FISHING INFORMATION – supplement



FISHING INFORMATION – supplement